

CLAIMS

PCT/SE99/00511

- 10 1. An apparatus (60) for controlling the size of, configuration of and/or duration of electric fields which are generated by a voltage generator (1) between electrodes (6,15,16,24) included in the apparatus or between electrodes (6,15,16,24) connected to the apparatus where the apparatus includes means (4,5) for distributing the voltage pulses to the electrodes (6,15,16,24) for the formation of the electric fields, and where the electrodes are designed to be secured at a restricted region of a human or an animal or are designed to be inserted in said region, characterized in that said region excludes the skin of a human or an animal, that an impedance measurement unit (50) included in the apparatus is disposed, on treatment of tissue or organs adjacent or in said region, to determine the impedance and/or resistance between said electrodes; and that a control and converter unit (10) is included in the apparatus or is connected thereto in order, prior to each voltage pulse or chain of voltage pulses and based on the measurement impedance and/or resistance, to control the size of, number of, configuration of and/or duration of the voltages applied to the electrodes.
- 15 2. The apparatus as claimed in Claim 1, characterized in that the control and converter unit (10) includes a VDU (10a); that the control and converter unit is disposed, prior to the start of the generation by the voltage generator (1) of a pulse or chain of pulses, to show on the VDU (10a) the form of the pulse or chain of pulses calculated by the control and converter unit; and that means are included in said control and converter unit for manual or automatic acceptance of said calculated formation.
- 20 3. The apparatus as claimed in Claim 1 or 2, characterized in that the electrodes (6,15,16,24) are common for the impedance measurement unit (50) and for said means (4,5) for emitting voltage pulses; or that separate electrodes (4,5) are provided for the impedance measurement unit and said means for emitting voltage pulses.
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AMENDED SHEET

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4. The apparatus as claimed in ~~any of the preceding Claims~~,
c h a r a c t e r i z e d in that the electrodes (6,15,16,24) are
disposed, to be placed in a restricted region in a human or in an
animal or in positions entailing that the electric fields pass
through said region.
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5. The apparatus as claimed in ~~any of the preceding Claims~~,
c h a r a c t e r i z e d in that the apparatus includes means
(34) for supplying therapeutic substances, genetic material and/or
ionizing radiation to said restricted region of a human or of an
animal; or that the apparatus is designed to cooperate with such
means (34).
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6. The apparatus as claimed in ~~any of the preceding Claims~~,
c h a r a c t e r i z e d in that the apparatus includes sensors
(8) for detecting electric fields formed by the electrodes
(6,15,16,24); and that the sensors are connected to a registration
and converter device (10) for calculating the size of the electric
field strength in the treatment region; and that, for regulating
the amplitude of the voltage pulses applied on the electrodes, the
registration and converter device (10) is connected to the high
voltage generator (1) and/or to means (2,3,4) connected inbetween
the high voltage generator (1) and the electrodes (6,15,16,24).
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7. The apparatus as claimed in ~~any of the preceding Claims~~,
c h a r a c t e r i z e d in that the electrodes (6) are disposed
to be excited alternately and only two at a time.
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8. The apparatus as claimed in ~~any of the preceding Claims~~,
c h a r a c t e r i z e d in that the apparatus includes sensors
(14) for detecting the distance between the electrodes (6) in each
pair of excited electrodes; and that said registration and con-
verter device (10) includes means for adjusting the voltage between
the electrodes (6) in each pair of excited electrodes based on the
distance between the electrodes.

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9. The apparatus as claimed in ~~any of the preceding Claims~~,¹ characterized in that the electrodes (6) are designed as needles (15) or stilettos (16).
- 5 10. The apparatus as claimed in ~~any of the preceding Claims~~,¹ characterized in that the electrodes (6,15,16,24) are wholly surrounded by an electrically insulating layer (17) or have an electrically insulating layer which at least leaves an electrically conductive tip of the electrodes uninsulated.
- 10 11. The apparatus as claimed in ~~any of the preceding Claims~~,¹ characterized in that an electrode applicator (5,23) is provided for at least temporarily fixing the electrodes prior to the placing of the electrodes on or in the treatment region.
- 15 12. The apparatus as claimed in Claim 11, characterized in that the electrode applicator (23) is of a size and configuration which is adapted to the vessel, bodily aperture or bodily cavity where it is to be placed.
- 20 13. The apparatus as claimed in Claim 11, characterized in that the electrode applicator (5) includes a fixture (18) for fixing the electrodes (15,16) in a fixed pattern.
- 25 14. The apparatus as claimed in Claim 11, characterized in that the fixture (18) is provided with a number of holes for placing electrodes in a desired pattern on each treatment occasion.
- 30 15. The apparatus as claimed in Claim 11, characterized in that the electrode applicator (23) is provided with electrodes (24) placed on the applicator's surface; or that the electrodes (24) are placed in channels (25) discharging in apertures in the surface of the applicator and, by means of remote control, displaceable in the channels and at least partly out through the
- 35 apertures in order to be inserted into the tissue around the applicator.
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16. The apparatus as claimed in ~~any of Claims 1-10,~~
c h a r a c t e r i z e d in that the apparatus includes at least
one cannula (19) each one disposed for temporarily enclosing an
electrode.
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17. The apparatus as claimed in ~~any of the preceding Claims,~~
c h a r a c t e r i z e d in that the electrodes (6,15,16,24)
consist of radioactive material or are designed with apertures for
accommodating radioactive preparations (21).
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18. The apparatus as claimed in ~~any of the preceding Claims,~~
c h a r a c t e r i z e d in that the electrodes (6,15,16,24) are
coated with a layer (27) of porous material for accommodating
therapeutic substances (28).
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